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# ECONOMICS

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## *Sociology*

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## MODEL OF MARKET ORIENTATION OF HIGH-TECH FIRMS IN THE CZECH REPUBLIC

**Abstract.** This article will contribute to better understanding of the phenomenon of market orientation and measurement of market orientation on the Czech market. The primary aim of this paper is to describe a concept of market orientation and to develop a modified model of market orientation (MMOM). The target group of respondents is mainly managers (N=328) of high-tech companies. Reached respondents were asked to fill in a questionnaire prepared on a website in digital form. A seven-point Likert-type scale ranging from 1 (absolutely disagree) to 7 (absolutely agree) were used to help the respondents express their opinion. The main method of statistical analysis is exploratory and confirmatory factor analysis. This analysis supported the hypothesis about four-factor structure. Four dimensions (Customer Intelligence Generation, Competitor Intelligence Generation, Intelligence Dissemination & Integration and Responsiveness to Market Intelligence) were found.

**Keywords:** Market Orientation, Exploratory and Confirmatory Factor Analysis, Reliability, Validity, High-Tech Sector, Czech Republic, MMOM, MMOS

**JEL Classification:** M31, M10

## Introduction

The main aim of this contribution is to create a model of market orientation of high-tech firms with emphasis on the current trends in management and marketing. Market orientation of firms is a concept which is particularly used in the strategic marketing. The whole field of research belongs to popular, however not much explored topics in the Czech Republic so far. Today the need to use modern scientific approaches, enabling firms to act more effectively, is still permanently increasing. It can be done only when the firms are sufficiently aware of their market environment, which is changing of course, and therefore it is necessary to react adequately and to adapt to present trends. The firms are forced to a permanent improvement and modernization of the offered products due to increasing competition in the global environment and growing requirements of the key customers. Management of the firm in present market conditions requires an active involvement of all departments across the whole firm and its coordination. The author tries to proceed from older models of market orientation and to evaluate their strong and weak points. In this study a particular emphasis is placed not only on importance of spreading of market information (dissemination) within the high-tech firm, but also on integration and change to knowledge that may be used by the company management

during the planning of a particular strategic action. The studies performed so far across all continents mostly showed that market orientation is measurable and its proper implementation has a positive influence on the company performance. It is necessary to point out that there still exists a range of geographic places and business sectors where valid measurement has never been realized yet. It is recommended to repeat the research after certain time in the areas where it was already performed. The solved topic offers a high potential to pick up the threads of contemporary world results and detailed research of market orientation of firms from the point of view of theory and practice in our country.

### **1. Concept of market orientation and definition**

The basic principle of market orientation is to reach success owing to fact that the firm, within its decision-making process, “is led“ by market. Majority of definitions place emphasis on a customer, particularly identification and satisfaction of his needs. However, this problem may be viewed from different angles. Therefore the following lines shall outline definitions of market orientation according to important authors.

Shapiro was concerned with definition of market orientation in 1988 (Shapiro, 1988). He came to the conclusion that a company is market-oriented if it is successful at getting information about customers, which will be used properly and processed in all company sections. Respected theorists, Jaworski and Kohli (1990, 1993) understand market orientation as an implementation of the marketing concept. These authors define market orientation as a process of getting information (Generation), its spreading in the company (Dissemination) and response in the form of strategic action (Responsiveness). They connect market orientation with company philosophy and claim that market orientation shows also a positive effect on employees, because their satisfaction shall naturally be reflected in their work performance. The authors also deal with relation of market orientation and company performance and generally, with methods of its measurement, including implementation of market strategy. Their study was highly-developed from the point of view of validity, still the authors are often criticized for a small number of analyzed firms. Nevertheless, it can be claimed that they give one of the top quality analysis of market orientation that has ever been published. Their model is known and abbreviated as MARKOR.

One of the first studies on market orientation was also published by Narver and Slater (1990). They think that realization of market orientation is based upon the firm openness towards market information. The authors place the biggest emphasis on a purposeful getting of market information about current and potential customers (Customers Orientation), about competition (Competitors Orientation) and they introduce notion “interfunctional coordination”. It is based on an idea that the present company marketing is not only task of the marketing department, but it is a synchronization of all company activities across all company departments that has to be applied into innovation strategy. This business approach is based upon the firm openness towards market information and should be a part of each company culture and marketing concept, as well. Market orientation, according to these authors, is actually a company culture which consists in the fact that all employees participate in creating values for customers. Their work was also often criticized in the past, particularly because they did not sufficiently dealt with empirical validity of questionnaire items and they excessively relied on theoretical conclusions only. Despite all critics, their model MKTOR became quickly popular and today the authors belong to the most quoted in the world in the field of market orientation of firms (Jangl, 2014).

Mohr et al. (2014) in his publication brings synthesis of the above mentioned models. Market orientation is understood as a four-dimensional construct - Market Intelligence Generation, Intelligence Dissemination, Intelligence Integration and Responsiveness to Market Intelligence, or rather Coordinated Action. This model has a more difficult structure at first sight. Within the first dimension, the authors distinguish proactive and responsive intelligence generation with emphasis on customers and competition. Karlíček (2013) states that if the firm is concentrated on needs the customers are aware of, it is a responsive market orientation then. And on the other hand, proactive market orientation means that the firm is concentrated on hidden needs of customers. Further, dimension Intelligence Integration is worth mentioning, where great emphasis is laid on transformation of information into knowledge assets. Knowledge in the firm is valued more than mere information. Information must be transformed into knowledge. All available information and knowledge must be projected into key decisions of management. Dimension Intelligence Dissemination and Coordinated Action are understood similarly as in the model MARKOR.

Often the world-quoted author, Prof. Kotler (1977, 2013), in his concept of market orientation referred many times to external dimensions of a firm, i.e. to a balance between orientation on customers and competitors. Analogically, Tomášková (2005) gives her own definition. In her opinion, market orientation is such an approach that enables managers to focus on external and internal environment and activities that have a positive influence on the company performance. Her concept of market orientation involves internal, external and professional environment of the firm. This way she responds to criticism that original models lay too much stress upon getting information about customers and competition and they take further stakeholders into consideration only a little.

## 2. Research method and sample structure

The target group were marketing and sales managers from the selected high-tech companies in the Czech Republic. Representative selection of high-tech firms was determined in database Albertina according to classification of CZ-NACE (revision 2). The classification of economic activities CZ-NACE is used in the Czech Republic and it is based on the international classification NACE (Nomenclature générale des Activités économiques dans les Communautés Européennes) which is in force in the European Union. The data were gathered and analysed between September 2014 and January 2015. Within the main study 1018 Czech firms from high-tech branch of manufacturing industry were addressed. The analyzed firms concentrated on: production of pharmaceutical products and services; production of computers and electronical components, production of consumer electronics and optical instruments, production of measuring, testing, navigation and medical instruments and production of planes and their engines, spaceships and associated equipment. Questionnaire was always completed by a competent manager (marketing, sales, production, CEO) who had a good track of the company affairs. 328 managers provided complete data to be processed. Data matrix was divided into two halves. 164 respondents were used for the purposes of exploratory factor analysis and 164 respondents for confirmatory factor analysis. A seven point Likert scale was used for measurement of market orientation. Data were processed and modeled in programs IBM SPSS Statistics version 21 and IBM SPSS AMOS version 22.

**Research Hypothesis:** There is a four-factor solution of market orientation model of high-tech firms in the Czech Republic.

Construction of the shortened version of measuring scale was carried out in accordance with the recommended procedures according to DeVellis (2003), Churchill (1979) in six steps:

1) Definition of market orientation and identification of dimensions

Based upon the secondary search of literature, e.g. Mohr et al. (2014) and the analysis of other popular models MARKOR (1993) and MKTOR (1990) the following four dimensions were determined to be the most suitable for research of the Czech high-tech firms:

- Intelligence Generation
- Intelligence Dissemination
- Intelligence Integration
- Responsiveness to Market Intelligence

2) Generation of 33 items representing the 4 dimensions

Individual items of the questionnaire were created by the help of a qualitative research (semi-structured interview). Before the main research a short pre-test was carried out in order to check comprehension and to simplify structure of the questionnaire. A group of eight members, consisting of experts, academicians and managers, expressed their independent opinion to what extent questions in the questionnaire correspond to the measured properties.

According to Lawshe (1975) in Ferjenčík (2010) there is a relation to calculate a content validity:

$$CVR = (n_e - N/2) / (N/2);$$

whereas  $n_e$  is number of evaluators who marked the item to be suitable for measurement of the required property;  $N$  is number of all addressed experts

Index CVR gets values in the closed interval  $[-1; +1]$ .  $CVR \geq 0$  can be interpreted so that the questionnaire items are chosen suitably. Everybody expressed himself that the questionnaire items were chosen suitably ( $CVR=1$ ).

3) Data collection from 9/2014 to 10/2014;  $N=164$

Quantitative research of market orientation was carried out via written questionnaire. A standard seven point Likert scale, in which everybody subjectively evaluates the rate of his approval with statements, was used in the questionnaire of market orientation. The addressed respondents were asked to complete the prepared “on-line” questionnaire placed on the Tomas Bata University website.

4) Evaluation of reliability and factor structure: (Cronbach’s Alpha, Inter-Item Correlation Matrix, Exploratory Factor Analysis)

By the help of methods of exploratory factor analysis we managed to detect common factors that measure the same variable. Some critics of this method, Nunnally (1978) or Mulaik (1987) object that there is a high rate of subjectivity in interpretation, which leads to disunity of results. On the other hand, such diversity supports and develops creative thinking. Suitability of this method was tested before its using, e.g. by analysis of correlation matrix of all items. Task of the correlation analysis is to describe mutual relations. Latent factors in the factor model we want to identify are behind the correlated linear manifest variables. Kaiser Meyer-Olkin rate and Bartlett’s test were used for examination of suitability to use the exploratory factor analysis. After creation of the factor model we

checked reliability and validity. For the purposes of research of market orientation, inner consistence of items of latent factors was detected by the help of Cronbach's Alpha coefficient.

5) New data collection 11/2014 to 12/2014; N=164

6) Evaluation of reliability and validity (Confirmatory Factor Analysis, Composite Reliability, Convergent and Discriminant Validity)

Validity gives us information to what extent the method measures what it was designed for. Content and construct (convergent and discriminant) validity was studied at work. Purpose of these chapters is not to describe reliability or validity too thoroughly, or to derive formulas. Details can be found in the professional literature. For instance Disman (2002), Urbánek, Denglerová and Širůček (2011) or Ferjenčík (2010) deal with measurement of reliability and validity in more details. Confirmatory factor analysis has been used and accepted modern method for years. Schumacker and Lomax (2010), Kline (2011). Confirmatory factor analysis enabled to test hypothesis about factor structure of the model.

### **3. Analysis and Results**

#### **Exploratory factor analysis**

The analysis included 33 items of the questionnaire. Before extraction of factors it is necessary to check whether the data are suitable for the use of exploratory factor analysis. At first there was calculated index Kaiser Meyer-Olkin Measure of Sampling Adequacy (KMO=0.904) in program SPSS Statistics. According to Hair et al. (2010) the values from 0.5 to 1.0 indicate suitability of using the exploratory factor analysis. Further, it was calculated that the correlation matrix is not an identity matrix, see Bartlett's test of Sphericity (4455; df=528;  $p<0.001$ ). At the same time, correlation matrix was studied, which referred to a possible existence of common factors. However, value of correlations must be higher than 0.3. Hair et al. (2010) It definitely results from the correlation matrix that mutual correlations of items are higher than the recommended value 0.3 and therefore it will be possible to find common factors.

For extraction of factors was used method of main components with Varimax rotation. Because method of main components forms mutually independent factors. Orthogonal Varimax rotation considers that the factors are independent. Exploratory analysis detected four dimensions of market orientation where individual factor loads for items reach values higher than 0.7, which is a good result according to (Hair et. al, 2010). Acceptable lower limit is 0.5, according to the same author. From exploratory factor analysis it results that existence of a four-dimensional model of market orientation can be expected. These four factors account for 19.9; 17.9; 17.7 and 16.6% of the total variance. Newly extracted factors were named Customer Intelligence Generation, Competitor Intelligence Generation, Intelligence Dissemination & Integration and Responsiveness to Market Intelligence, see Table1.

Table1. Results of exploratory factor analysis

Model designation	Items	Factor loading			
		F1	F2	F3	F4
<b>CUIG</b>	<b>Factor 1 – Customer Intelligence Generation</b>	<i>Cronbach's Alpha = 0.77</i>			
<b>CUIG1</b>	We systematically collect and evaluate data about satisfaction or non-satisfaction of customers.	<b>0.774</b>			
<b>CUIG2</b>	We have regular meetings with customers in order to learn their future expectations in time.	<b>0.837</b>			
<b>CUIG3</b>	We permanently strive for a deeper understanding of the hidden needs and requirements of customers.	<b>0.762</b>			
<b>COIG</b>	<b>Factor 2 – Competitor Intelligence Generation</b>	<i>Cronbach's Alpha = 0.86</i>			
<b>COIG1</b>	We monitor mutually competing firms in our branch.		<b>0.839</b>		
<b>COIG2</b>	We try to predict a future behaviour of competitors.		<b>0.835</b>		
<b>COIG3</b>	We perform evaluation of strong and weak points of major competitors.		<b>0.849</b>		
<b>IDI</b>	<b>Factor 3 - Intelligence Dissemination and Integration</b>	<i>Cronbach's Alpha = 0.78</i>			
<b>IDI1</b>	We inform each other about successful and unsuccessful experience with customers across all company departments.			<b>0.761</b>	
<b>IDI2</b>	In our company we hold a lot of formal and informal talks where we solve present business success, market opportunities or risks.			<b>0.841</b>	
<b>IDI3</b>	Market information are integrated in this workplace before decisions are made.			<b>0.829</b>	
<b>RMI</b>	<b>Factor 4 - Responsiveness to Market Intelligence</b>	<i>Cronbach's Alpha = 0.75</i>			
<b>RMI1</b>	Our reaction to the competitor's price campaign is very short.				<b>0.819</b>
<b>RMI2</b>	Principles of market segmentation control development of new products in our firm.				<b>0.741</b>
<b>RMI3</b>	We react immediately if the competition launches intensive advertising campaign aimed at our customers.				<b>0.732</b>

Note: The method of main components with rotation Varimax

Source: Own elaboration.

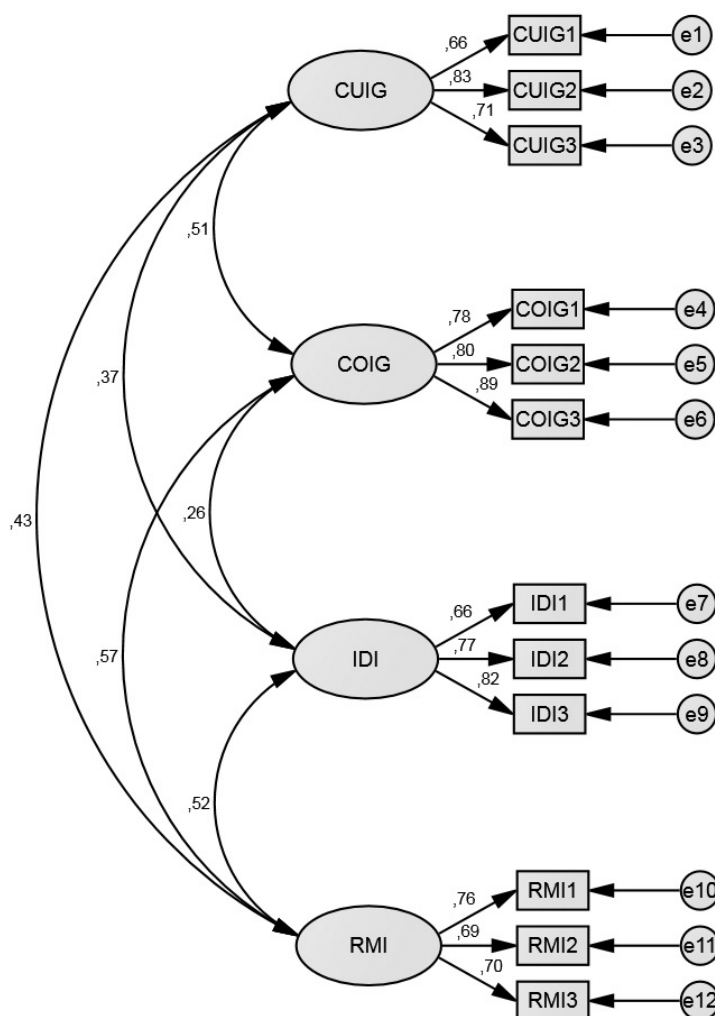
## Reliability

Reliability is necessary, but not a sufficient condition of validity. According to Malhotra and Naresh (2010) the final value of Cronbach's Alpha index should be higher than 0.6, according to Kline (2000) 0.7 at least. Table 1 shows values higher than 0.7, therefore all dimensions have a sufficient level of inner consistence of items.

## Confirmatory Factor Analysis

Confirmatory approach serves for confirmation of the expected relations between objects, and for testing hypothesis about accuracy of the suggested structure in the model. This type of analysis is normally used in practice for standardization of measuring instruments. Forming the model, process of modeling and confirmatory analysis were realized by the use of program IBM SPSS AMOS version 22. Parameters were estimated by the method of Maximum Likelihood. In order to confirm theoretical model, a new sample of high-tech firms will be used (N=164). Aim of the confirmatory factor analysis was to find out and review to what extent are

model and data identical. It will review global and local correspondence of model and data. It is necessary so that the covariance matrix generated by the model and the monitored data were as much identical as possible.



**Figure 1.** The modified model of market orientation MMOM (standardized estimates)

*Source:* Own elaboration.

Chi-square value in the model depicted in Fig. 1 is 60.867 (48df). Chi-square test is a basic criterion for reviewing the global correspondence of the model with data. It evaluates total quality of the model. Null hypothesis states that the given model is perfectly identical with data and alternative hypothesis states that the model is not suitable for the used data. The higher is p-value, the more reliable is the null hypothesis. Value  $p=0.101$ , therefore we do not refuse the null hypothesis. Ratio of chi-square test to degrees of freedom should ideally be approaching to value 1 from above; when reviewing liberally and in case of larger models can be accepted values lower than 3. The calculated value also meets this condition, so there is global correspondence of the model with data, see Table 2. Power of the chi-square test in case of structural modeling highly depends on size of the sample. In general, chi-square for the big selective files is high, and on the contrary, it is low for the small sized files (Urbánek, 2000), (Byrne, 2010). Therefore there are other indices (see Table 2) for reviewing the correspondence of model with data, and naturally, where united interpretation of authors does not apply.

Table 2. Overall goodness of fit measures for the model

Metric - fit index	Value range	Threshold for a well-fitting model
$\chi^2/df$ (Relative Chi-square)	1.268	< 2 for good model fit < 3 for acceptable fit
p-value for the model	0.101	> 0.05
CFI (Comparative Fit Index)	0.983	> 0.95
TLI (Tucker-Lewis Index)	0.976	> 0.95
AGFI (Adjusted Goodness of Fit Index)	0.911	> 0.80 for acceptable model fit > 0.95 for good model fit
RMSEA (Root Mean Square of Approximation)	0.041	< 0.08 for acceptable model fit < 0.05 for good model fit
PCLOSE (p-value for $H_0$ ; $H_0$ : RMSEA $\leq 0.05$ )	0.678	> 0.05

Source: Own processing according to Schumacker & Lomax (2010); Garson (2012).

Practically all the most used indices show satisfactory results, so it is possible to accept the null hypothesis about structure of market orientation model of the Czech firms.

Table 3. Unstandardized Estimates of Regression Weights and Covariances

Regression Coefficients			Estimate	S.E.	C.R.	p
CUIG1	<---	CUIG	1.00	-	-	-
CUIG2	<---	CUIG	1.30	0.17	7.50	***
CUIG3	<---	CUIG	1.17	0.16	7.20	***
COIG1	<---	COIG	1.00	-	-	-
COIG2	<---	COIG	1.10	0.11	10.40	***
COIG3	<---	COIG	1.27	0.11	11.16	***
IDI1	<---	IDI	1.00	-	-	-
IDI2	<---	IDI	0.98	0.13	7.59	***
IDI3	<---	IDI	1.08	0.14	7.66	***
RMI1	<---	RMI	1.00	-	-	-
RMI2	<---	RMI	0.92	0.13	7.41	***
RMI3	<---	RMI	1.06	0.14	7.49	***
Covariances			Estimate	S.E.	C.R.	p
CUIG	<-->	COIG	0.34	0.08	4.31	***
CUIG	<-->	IDI	0.24	0.07	3.26	**
CUIG	<-->	RMI	0.29	0.08	3.69	***
COIG	<-->	IDI	0.25	0.10	2.58	**
COIG	<-->	RMI	0.56	0.12	4.82	***
IDI	<-->	RMI	0.49	0.12	4.18	***

Note: Maximum Likelihood Estimates; S.E. = Standard Error; C.R. = Critical Ratio;

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$

Source: Own elaboration.

For the each estimated value of a free parameter the relevant value of standard error is also calculated and on the bases of these two values are calculated t-values (as a part of value of parameter and its standard error), enabling test of statistic significance of the individual parameters. As statistically significant parameters are considered those, whose absolute values of t-values are higher than 1.96. Similarly, as it is with regression coefficients in case of a multiple regression, it can be found out which parameters of the model contain important information



## RECENT ISSUES IN ECONOMIC DEVELOPMENT

about relations between variables of the model and which do not (Urbánek, 2000). In other words, if C.R. value (Critical Ratio)  $> 1.96$ , then the estimated parameter is significant. The three stars (\*\*\*) show that the value is statistically significant ( $p < 0.001$ ). Only cases where a parameter was fixed at 1 are not depicted. All relations in the model are statistically significant.

### Construct Validity

Construct validity can be reviewed on the basis of relations between manifest and latent variables in the model. Hair et al. (2010) There are two basic types of construct validity: Convergent and Discriminant Validity. Convergent validity is the most commonly used method for testing the construct validity. In this study convergent validity was measured by the help of Composite Reliability (CR) and Average Variance Extracted (AVE). (Fornell and Larcker, 1981) Index Composite Reliability is often used with structural equation modeling. Its interpretation is similar to Cronbach's Alpha. Discriminant validity is a test to ensure there is no significant variance among different variables that could have the same reason. Discriminant validity indicates a difference between one construct and another in the same model. (Ghadi et al., 2012).

It results from table 4 that all conditions for confirmation of convergent and discriminant validity are satisfied.

Table 4. Convergent and Discriminant Validity

MODEL DESIGNATION	CR	AVE	MSV	ASV	CONVERGENT VALIDITY	DISCRIMINANT- VALIDITY
					CR > AVE	MSV < AVE
					CR > 0.7 $\wedge$ AVE > 0.5	ASV < AVE
CUIG	0.779	0.543	0.257	0.194	Yes	Yes
					Yes	Yes
COIG	0.862	0.677	0.324	0.216	Yes	Yes
					Yes	Yes
IDI	0.795	0.566	0.265	0.156	Yes	Yes
					Yes	Yes
RMI	0.757	0.510	0.324	0.259	Yes	Yes
					Yes	Yes

Note: CR (Composite Reliability); AVE (Average Variance Extracted); MSV (Maximum Shared Squared Variance); ASV (Average Shared Squared Variance);  $\wedge$  conditions must be applied concurrently

Source: Own elaboration.

### 4. Discussion

Modified model of market orientation of high-tech firms is formed by four latent and twelve manifest variables. However, individual dimensions differ from the originally theoretically suggested variant. The first examined dimension Market Intelligence Generation was divided into two separate factors: Customer Intelligence Generation and Competitor Intelligence Generation. Value of Pearson's correlation coefficient between both factors is 0.51. Factor loadings are significant. Factor Competitor Intelligence Generation reaches higher values of reliability 0.86. On the contrary, dimension Intelligence Dissemination and Intelligence Integration were combined together on the basis of results of exploratory analysis. Both factors have a very similar content and their mutual correlation, measured by Pearson correlation coefficient, reached value 0.7. This is also the reason why common factor can be accepted. Original models

## RECENT ISSUES IN ECONOMIC DEVELOPMENT

e.g. MARKOR (1993) ignored factor Intelligence Integration. However, today's decision-making process places more emphasis on knowledge, not information. Last factor Responsiveness to Market Intelligence was extracted individually in accordance with theoretical assumptions. From the Table 5 we can argue that the modified model MMOM has conclusively better fit.

Table 5. Comparison of two models

THE MODEL BASED ON THE THEORY	THE MODIFIED MARKET ORIENTATION MODEL - MMOM
Market Intelligence Generation	Customer Intelligence Generation Competitor Intelligence Generation
Intelligence Dissemination Intelligence Integration	Intelligence Dissemination & Integration
Responsiveness to Market Intelligence	Responsiveness to Market Intelligence
<b>Model Fit:</b> $\chi^2/df=2.42$ ; p-value=0.00; CFI=0.88; TLI=0.84; RMSEA=0.08; PCLOSE=0.01	<b>Model Fit:</b> $\chi^2/df=1.27$ ; p-value=0.10; CFI=0.98; TLI=0.98; RMSEA=0.04; PCLOSE=0.68

*Source:* Own elaboration.

There has not yet been performed analysis of market orientation of firms by the help of structural modeling in the Czech Republic, therefore no comparable data are available. Deshpandé and Farley (1998), Farrell and Oczkowski (1997) were trying to do similar simplification of model of market orientation abroad. They simplified the two best known models (MARKOR and MKTOR). At the same time they recommend shorter scales to be more suitable. Their smaller modified models show better fit than the original versions.

Size of the sample plays an important role in using structural modeling. As far as structural modeling is concerned, there is not an agreement between authors how much observation is needed to get results of a good quality. Kline (2011) recommends  $N > 200$ . Bentler and Chow (1987) suggest that the ratio of sample size to estimated parameters should be at least 5:1. This more permissive condition was satisfied, because number of estimated parameters was 30 and size of the sample ( $N=164$ ). There were addressed more managers within one company to complete the questionnaire, otherwise it would not be possible to collect a sufficient number of observations in the Czech Republic. Just for comparison, Chalupský et al. (2009) studied market orientation of high-tech firms by Tomášková method on sample of 87 firms, however they did not use structural modeling for analysis.

## Conclusion

The main aim of this study research was to study dimensionality of market orientation on sample of the Czech high-tech firms. The author tested hypothesis about four-factor structure in order to create shortened measuring scale of market orientation. On the basis of the performed analysis it could be said that the set target was realized.

Originality of the work also consists in the used methodology. Primary research was realized in the high-tech sector. Subjective attitudes of individual managers in the individual firms were evaluated on the 7 point Likert scale. Dimensionality of the construct was initially determined by the help factor analysis. Thanks to exploratory and confirmatory factor analysis all relations of the market orientation construct could be studied in depth. Exploratory analysis revealed four major latent factors: Customer Intelligence Generation ( $\alpha=0.77$ ), Competitor

Intelligence Generation ( $\alpha=0.86$ ), Intelligence Dissemination & Integration ( $\alpha=0.78$ ) and Responsiveness to Market Intelligence ( $\alpha=0.75$ ). Newly created measuring scale with 4 dimensions in the beginning contained 33 items and after cleaning 12 final items. The constructed model MMOM shows fair psychometric properties which were definitely proved (Model Fit:  $\chi^2/df=1.27$ ;  $p\text{-value}=0.10$ ;  $CFI=0.98$ ;  $TLI=0.98$ ;  $RMSEA=0.04$ ;  $PCLOSE=0.68$ ). Dimensionality of the model of market orientation by the help of confirmatory factor analysis has not been studied by anybody in the Czech Republic yet. Structural equation modeling enabled better understanding of relationship between subfactors and the more accurate approximation of reality.

The following definition of market orientation can be made on the basis of the modified MMOM model: The market orientation is a process of active collection of market information (Customer and Competitor Intelligence Generation), their sharing and integration within the working teams (Intelligence Dissemination & Integration) and using new knowledges during the planning of strategic action (Responsiveness to Market Intelligence). The above mentioned definition is partly based on knowledge management which, besides other things, deals in detail with transformation of information in knowledge. This issue is more discussed by authors such as Bureš (2007); Coakes, Willis and Clarke (2002) in specialized literature.

Modified model MMOM and new shorter version of measuring scale MMOS (see appendix) may serve both academicians and managers. Academicians will appreciate the model as a tool for understanding relations between individual dimensions of market orientation and managers will practically use the shortened measuring scale, which is described by this model.

For further confirmation of the model validity, or rather its modification, it is recommended to perform replication of research in the regular intervals Urbánek (2000). For this reason it would be worth considering to perform comparative studies between different regions and sector within EU. In the future it would also be convenient to test hypothesis about causal relationship between market orientation and innovations that are characteristic for high-tech sector. This hypothesis has never been studied in the territory of the Czech Republic.

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### References

- Bentler, P.M., Chou, C.P. (1987), Practical issues in structural modeling. *Sociological Methods & Research*, Vol. 16, pp. 78-117.
- Bureš, V. (2007), *Znalostní management a proces jeho zavádění*. Grada: Praha.
- Byrne, B. (2010), *Structural Equation Modeling: Pocket Guides to Social Research Methods*. Oxford University Press: New York.
- Coakes E., Willis D., Clarke S. (2002), *Knowledge Management in the Sociotechnical World*. Springer Verlag: London.
- Deshpandé, R., Farley, J.U. (1998), Measuring market orientation: Generalization and synthesis. *Journal of Market-Focused Management* Vol. 2 no. 3: pp.213–32.
- DeVellis, R.F. (2003), *Scale Development: Theory and Applications*, Newbury Park, CA: Sage.
- Disman, M. (2002), *Jak se vyrábí sociologická znalost: příručka pro uživatele*. Karolinum: Praha.
- Farrell, M.A., Oczkowski, E.A. (1997), An Analysis of the MKTOR and MARKOR Measures of Market Orientation: An Australian Perspective, *Marketing Bulletin*, Vol. 8, pp. 30-40.
- Ferjenčík, J. (2010), *Úvod do metodologie psychologického výzkumu*. Praha: Portál.

## RECENT ISSUES IN ECONOMIC DEVELOPMENT

- Fornell, C., Larcker, D.F. (1981), Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, Vol. 18, no.1, pp. 39-50.
- Garson, D. (2012), *Structural Equation Modeling: Statistical Association Publishing Blue Book Series*. Statistical Association Publishing, Asheboro.
- Ghadi, I., Alwi, N.H., Bakar, K.M, Talib, O. (2012), Construct Validity Examination of Critical Thinking Dispositions for Undergraduate Students in University Putra Malaysia, *Higher Education Studies*, Vol. 2, no.2, pp.138 – 145.
- Hair, J.F., Black, W.C., Babin, J.B., Anderson, R.E. (2010), *Multivariate data analysis* (7<sup>th</sup> ed.). USA: Prentice Hall, Inc.
- Chalupský, V., Kaňovská, L., Šimberová, I., Tomášková, E. (2009), *Výzkum implementace tržní orientace u hi-tech firem*. Brno: FP VUT v Brně.
- Churchill, G.A. (1979), A Paradigm for Developing Better Measures of Marketing Constructs, *Journal of Marketing Research*, Vol. 16, no. 1: pp. 64-73.
- Jangl, P. (2014), Market Orientation of Firms and its Measurement. In *Proceedings of the 2<sup>nd</sup> International Scientific Conference focused on Economics and Business Management in the 21<sup>st</sup> Century*. Vol. 2, no. 1, pp. 217-222.
- Karlíček, M. (2013), *Základy marketingu*, Praha: Grada.
- Kline, R.B. (2011), *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press.
- Kline, P. (2000), *The handbook of psychological testing*. London: Routledge.
- Kohli, A.K., Jaworski, B.J. (1990), Market orientation: the construct, research propositions and managerial implications. *Journal of Marketing*, Vol. 54, no. 2, pp.1-18.
- Kohli, A.K., Jaworski, B.J., Kumar, A. (1993), MARKOR: A Measure of Market Orientation. *Journal of Marketing Research*, Vol. 30, pp. 467 –77.
- Kotler, P. (1977), From Sales Obsession To Marketing Effectiveness. *Harvard Business Review*, Vol.55, no. 11/12, pp. 67-75.
- Kotler, P., Burton, S., Deans, K.R., Brown, L., Armstrong, G. (2013), *Marketing*. Pearson Australia.
- Lawshe, C.H. (1975), A quantitative approach to content validity. *Personnel Psychology*, Vol. 28.
- Mulaik, S.A. (1987), A brief history of the philosophical foundations of exploratory factor analysis. *Multivariate Behavioral Research*, Vol. 22, pp. 267-305.
- Malhotra, N., Naresh, K. (2010), *Marketing Research – An applied orientation global edition*, Upper Saddle River, New Jersey.
- Mohr, J.J. Sengupta, S., Slater, S., (2014), *Marketing of High Technology products and Innovations*. England: Pearson Education Limited.
- Narver, J.C., Slater, S.F., (1990), The Effect of a Market Orientation on Business Profitability. *Journal of Marketing*, Vol. 54, pp. 20-35.
- Nunnally, J. (1978), *Psychometric theory* (2<sup>nd</sup> ed.). New York: McGraw Hill.
- Shapiro, B.P. (1988). What the Hell Is ‘Market Oriented’?, *Harvard Business Review*, Vol. 66, no.11/12, pp.119-125.
- Schumacker, R. E., Lomax, R.G. (2010), *A Beginner’s Guide to Structural Equation Modeling*, New York and London: Taylor and Francis Group, LLC.
- Slater, S.F., Narver, J.C. (1994), Does competitive environment moderate the market orientation performance relationship? *Journal of Marketing*, Vol.58, pp.46-55.
- Tomášková, E., (2005), *Měření tržní orientace a její vliv na podnikový výkon*. Brno: Vutium.
- Tomášková, E., (2009), *Tržní orientace jako nástroj pro zvyšování konkurenceschopnosti*. Brno: Masaryk University.
- Urbánek, T. (2000), *Strukturální modelování v psychologii*. Brno: Pavel Křepela.
- Urbánek, T., Denglerová, D., Širůček, J. (2011), *Psychometrika*. Praha: Portal.

## APPENDIX

## The Modified Market Orientation Scale - MMOS

1. We systematically collect and evaluate data about satisfaction or non-satisfaction of customers.
2. We have regular meetings with customers in order to learn their future expectations in time.
3. We permanently strive for a deeper understanding of the hidden needs and requirements of customers.
4. *We manage to quickly notice changes in customer priorities.\**
5. We monitor mutually competing firms in our branch.
6. We perform evaluation of strong and weak points of major competitors.
7. We try to predict a future behaviour of competitors.
8. *We are familiar with product offers and competitor's prices very well.\**
9. *We ponder probable impact of economic and governmental changes on making decisions of business partners.\**
10. *We manage to quickly notice changes in priorities of suppliers and distributors.\**
11. *We verify information about current and potential suppliers and distributors.\**
12. *We analyse technological trends in our branch.\**
13. *We monitor firms which use similar technology.\**
14. *We perform research of market conditions and trends also in cooperation with external agencies or university departments.\**
15. *We organize meetings in order to discuss market trends and economic development.\**
16. *We meet before important decisions in order to integrate all available information.\**
17. *Marketing staff discusses customer needs with other departments.\**
18. *We spread documents for employees which provide information about major customers.\**
19. We inform each other about successful and unsuccessful experience with customers across all company departments.
20. *Company staff shares information about competitor's activity.\**
21. In our company we hold a lot of formal and informal talks where we solve present business success, market opportunities or risks.
22. Market information are integrated in this workplace before decisions are made.
23. *We work in teams and we celebrate common success.\**
24. *When making important decisions we consider all standpoints responsibly.\**
25. *We can use market opportunities promptly.\**
26. *We manage to implement new ideas in time; the organization provides effective reaction to market conditions this way.\**
27. *When solving the tasks the particular activities are well coordinated in all departments.\**
28. *Our firm permanently seeks for new opportunities how to expand and get new sources of income.\**
29. Our reaction to the competitor's price campaign is very short.
30. Principles of market segmentation control development of new products in our firm.
31. We react immediately if the competition launches intensive advertising campaign aimed at our customers.
32. *If customers are not satisfied with quality of our products, we adopt corrective measures.\**
33. *We will make great effort to make a change in case product properties do not comply with market expectation.\**

\* marked items were deleted during the measurement purification process